

An aerial photograph of a large, circular radio telescope dish, likely the Arecibo radio telescope, situated in a dense, green forest. The dish is a light gray color and is surrounded by a network of cables and support structures. The surrounding forest is thick and green, with some small buildings and roads visible in the background.

Circular polarization from a native linear receiver

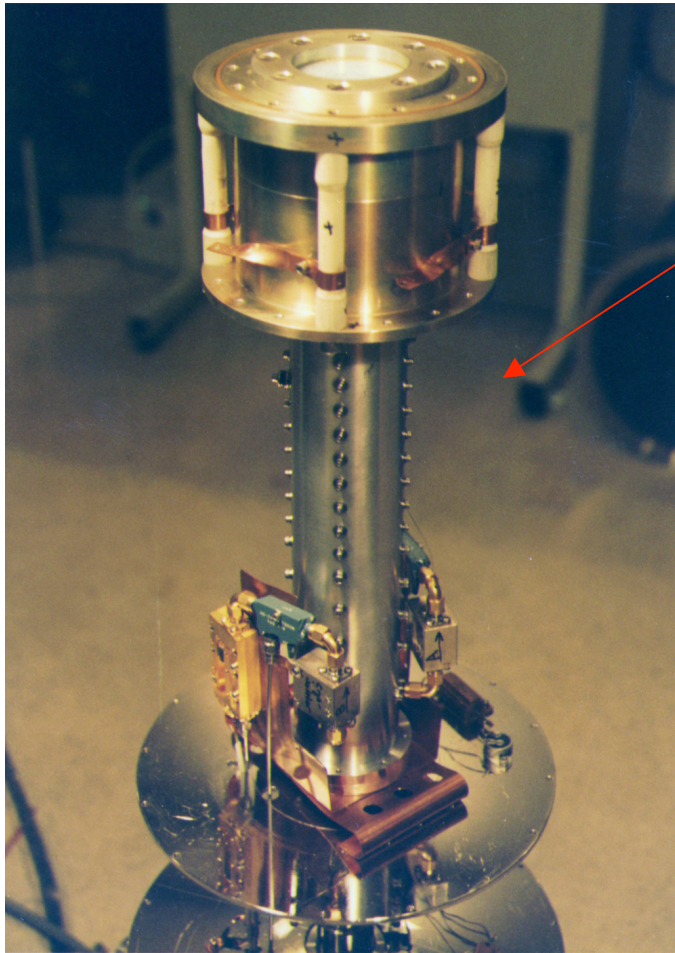
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Circular_{sky} \Rightarrow Native Linear \Rightarrow *Hybrid* \Rightarrow Circular

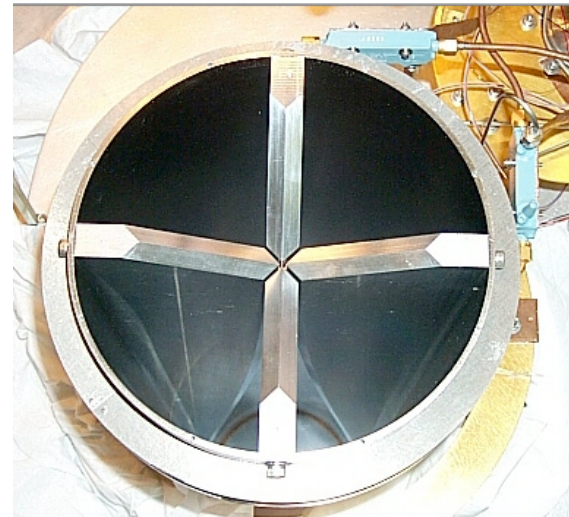


Mr. Polarization, aka Carl

C band and L band have native linear receivers with hybrids

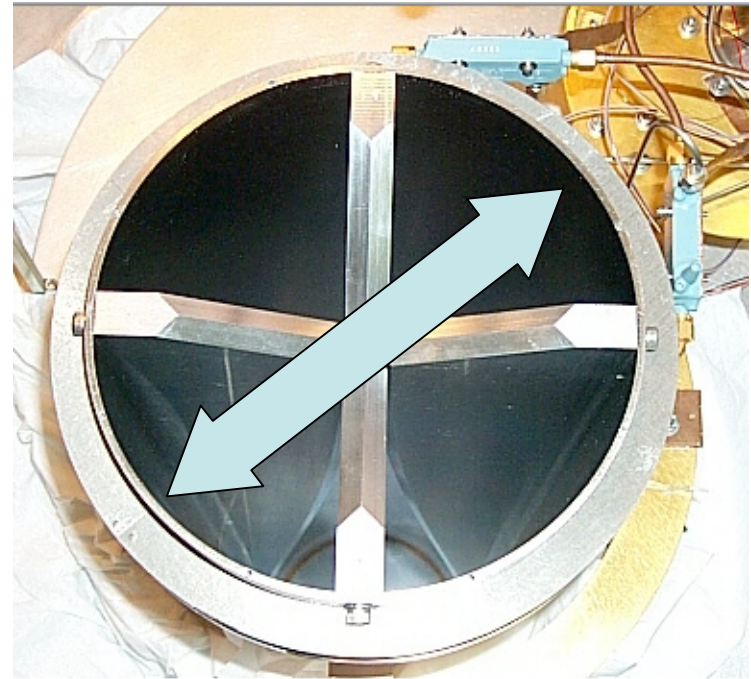
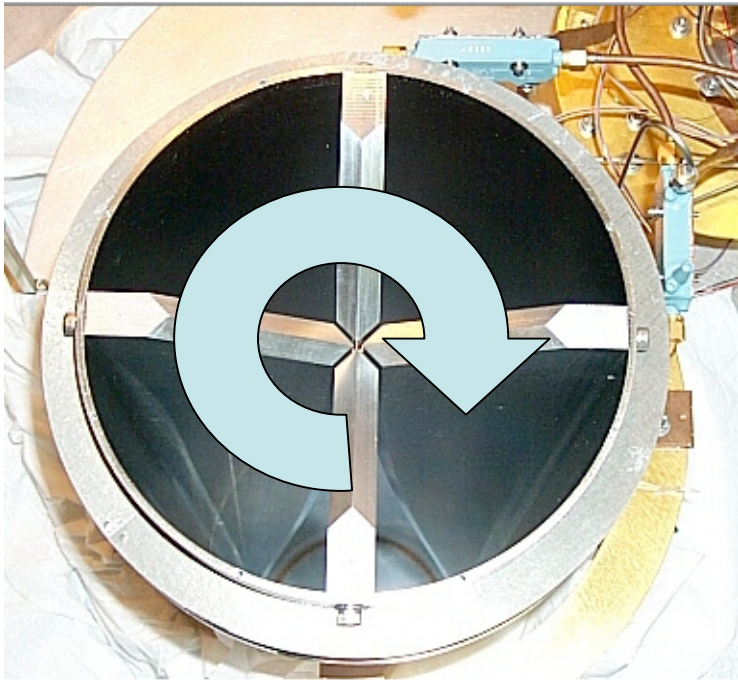


Quadridge OMT



Hybrids Convert From Native Linear to Circular

Both have equal amplitudes in both channels, but for circular the channels are offset by 90 degrees



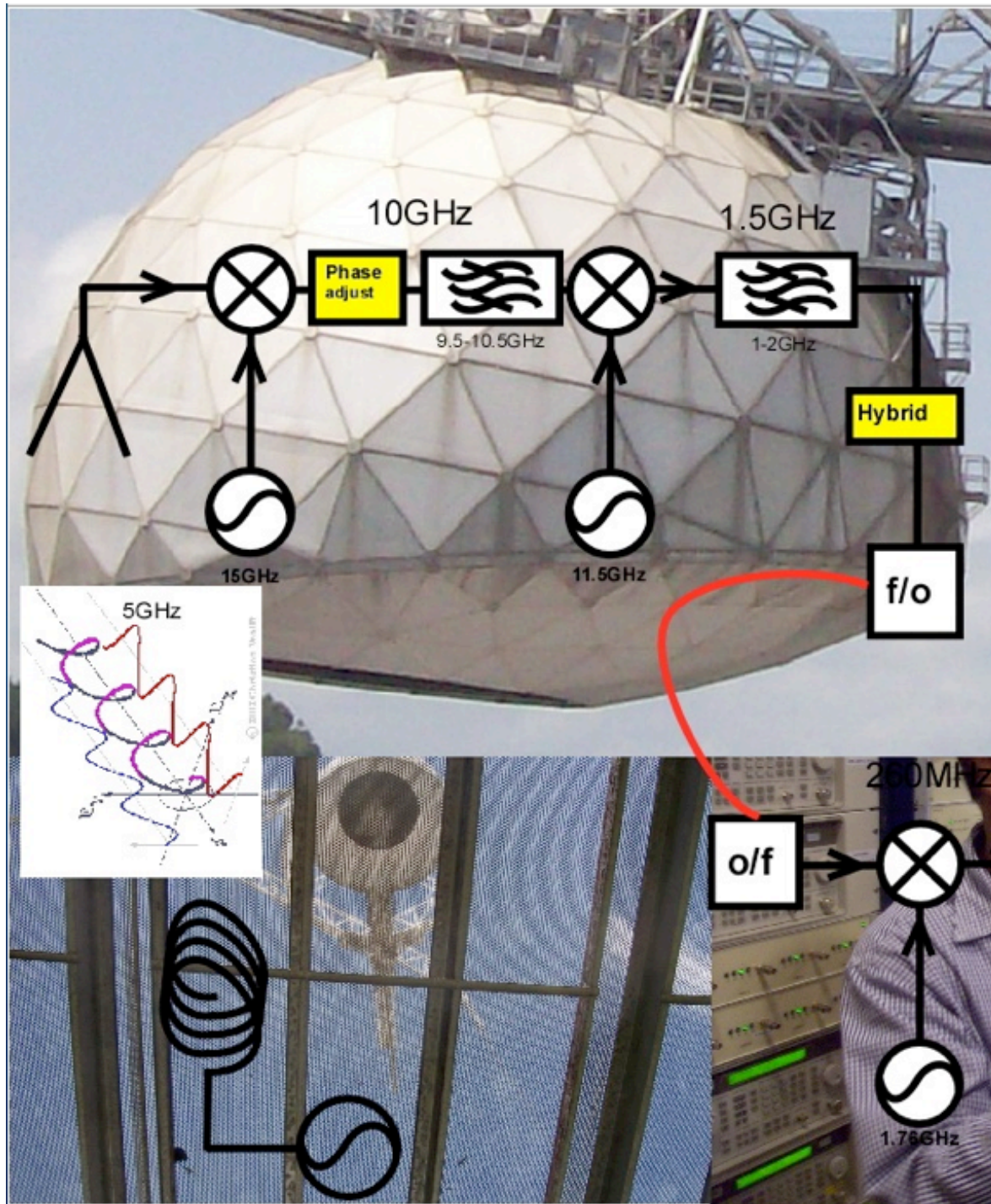
Benefits/hazards of native linear to circular conversion

- Benefits of converting native linear to circular
 - To mitigate feed rotation with parallactic angle effects
 - Simplification of obtaining VLBI fringes
 - Native linear OMTs have wider bandwidths
- Hazards of converting to circular with a hybrid
 - The hybrid adds noise and phase instabilities

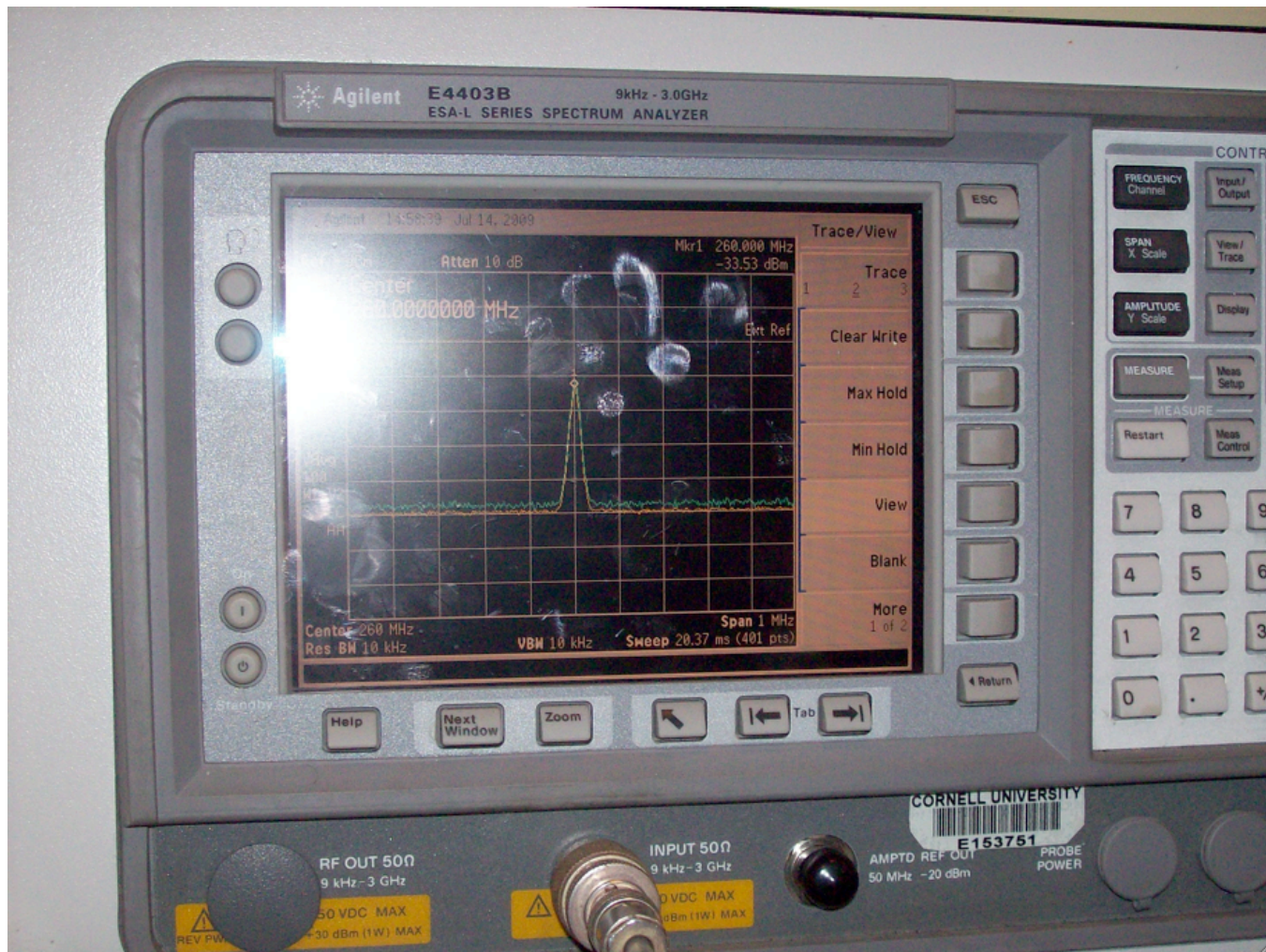
Transmitting circular polarization to C band receiver



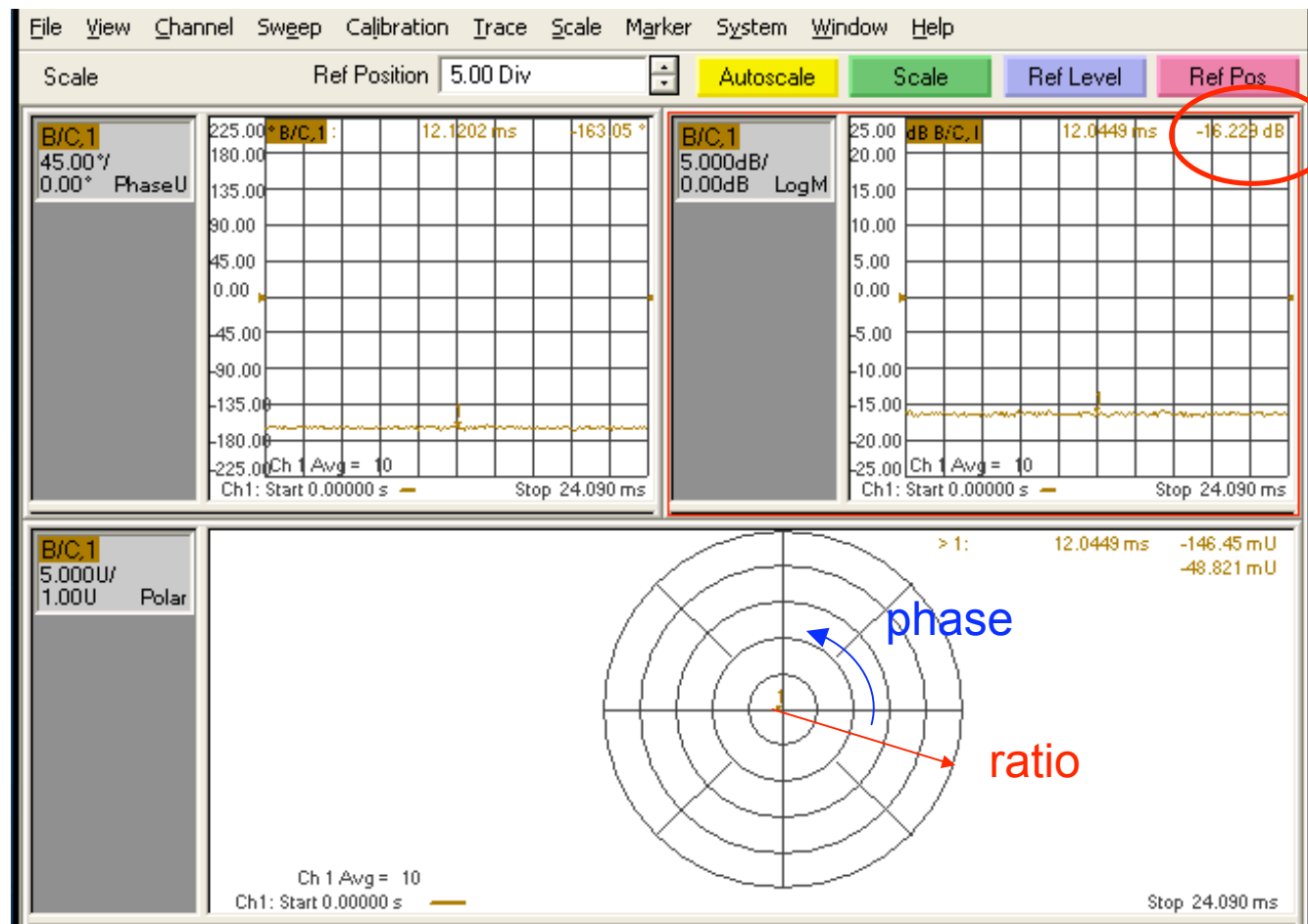
C-Band Instrument Configuration



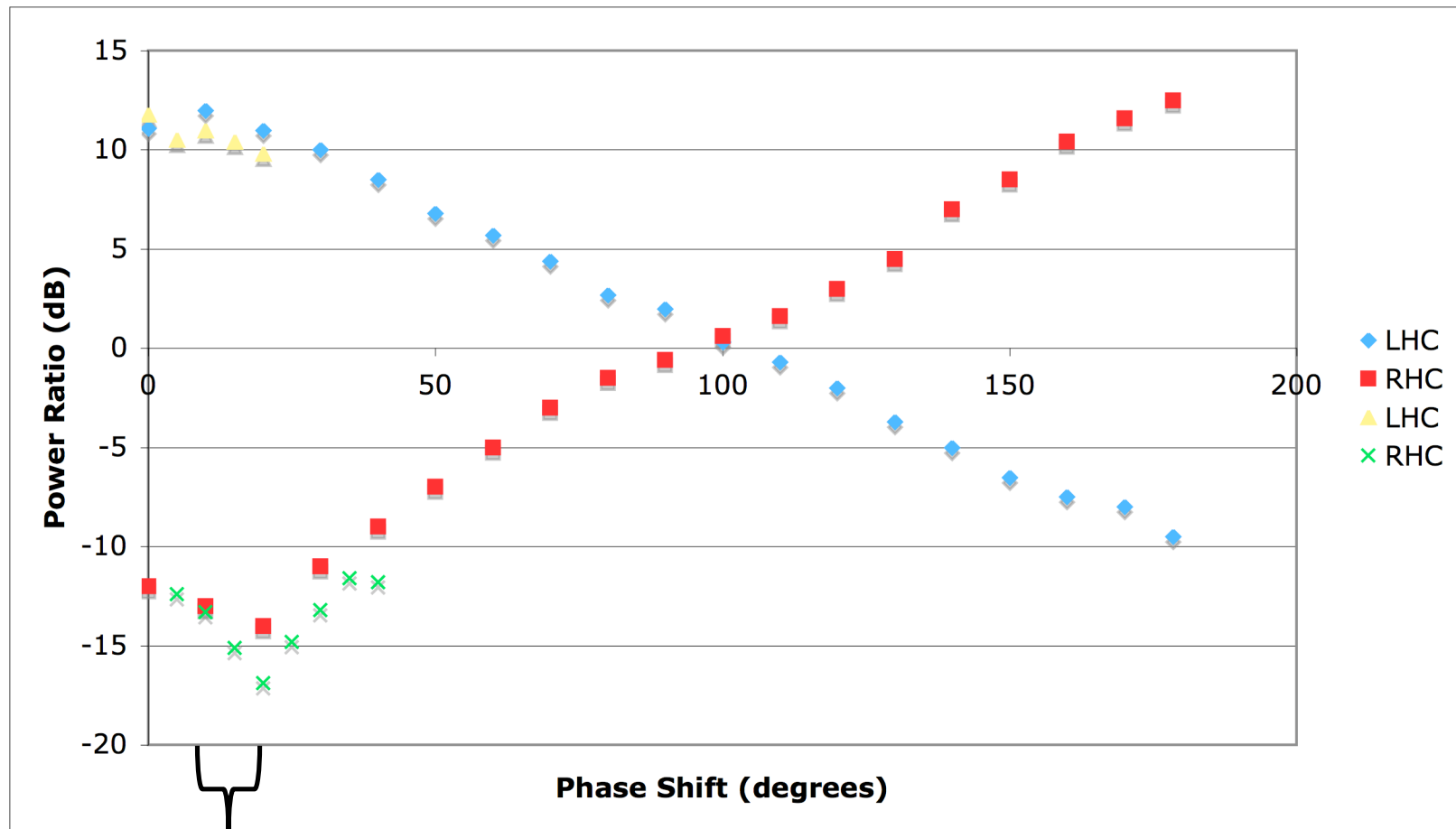
RHC and LHC outputs of hybrid viewed on spectrum analyzer



Used network analyzer to measure power ratio: P_{LHC}/P_{RHC}

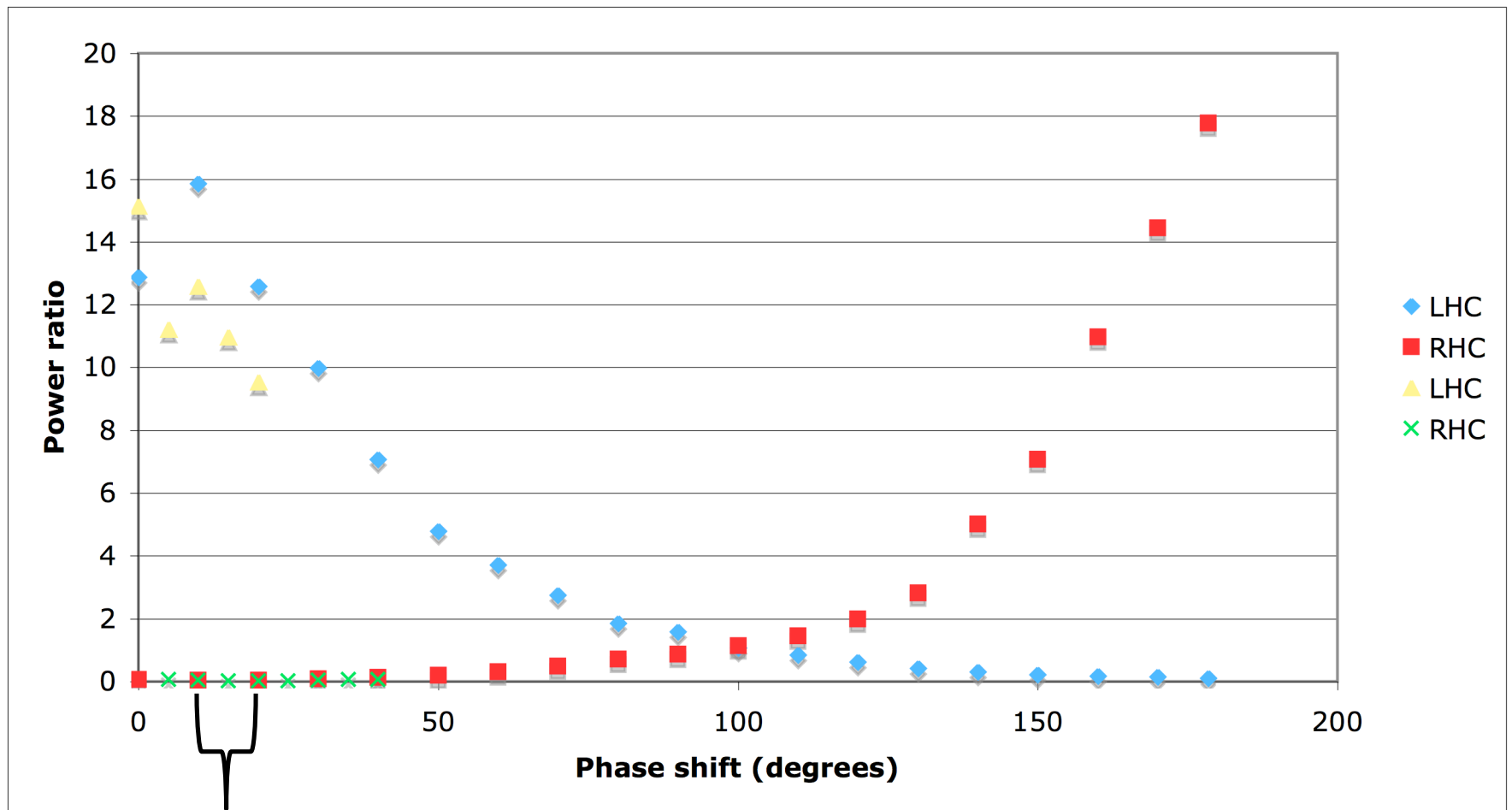


Optimum phase for conversion from linear to circular



optimum $\sim 15^\circ$

Optimum phase for conversion from linear to circular



optimum ~ 15°